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Commercial Sweet Pea Culture



In Greenhouse and Outdoors

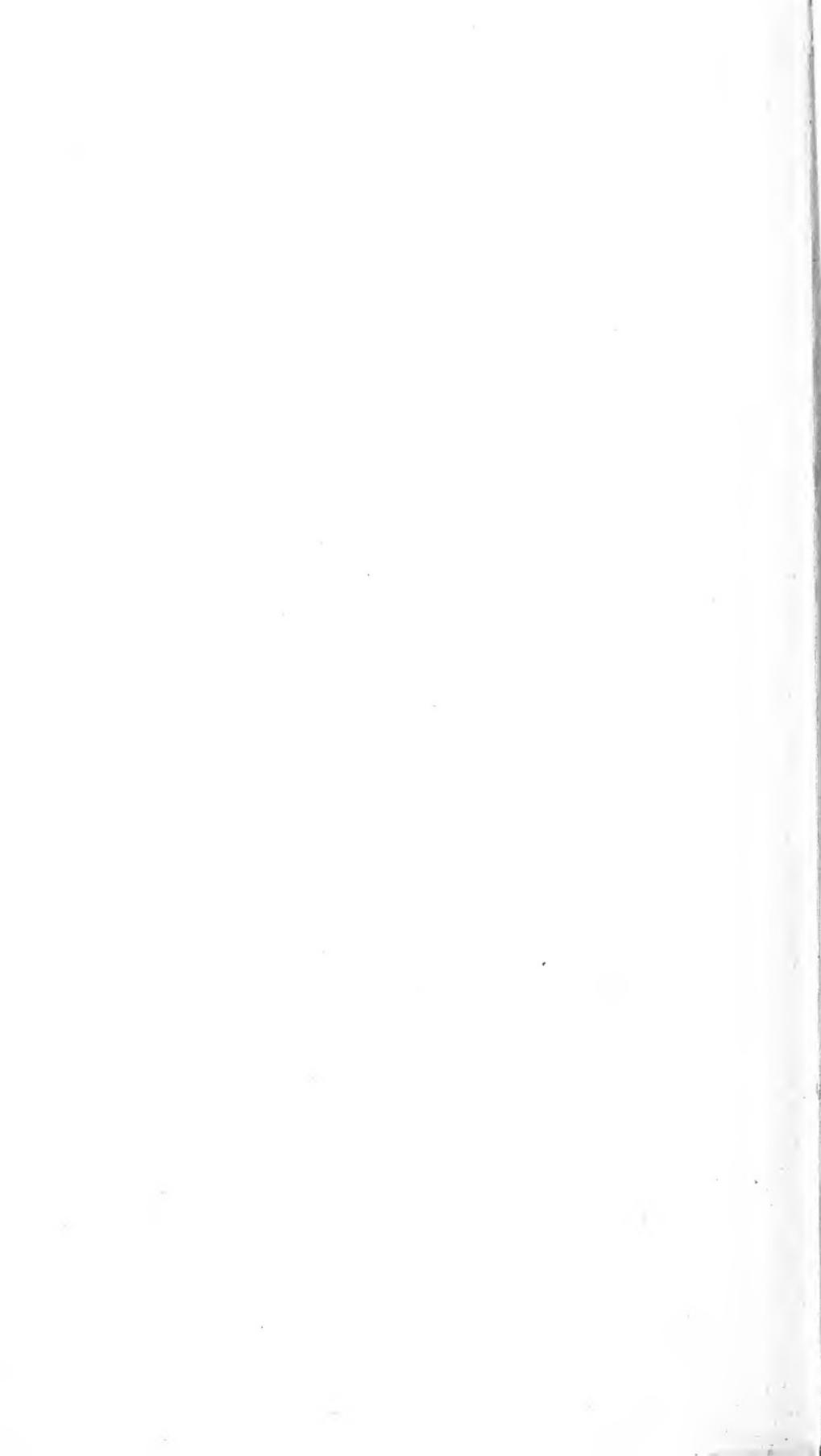
How to Pick, Keep and Ship the Flowers

Also HISTORY

By the ORIGINATOR of Every
Winter Flowering Sweet
Pea in Commerce

ANT. C. ZVOLANEK

A.A.S.



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MR. ANT. C. ZVOLANEK
Originator of Every Winter-Flowering Sweet Pea in
Existence, except Early Sunbeam

PART I.

WINTER-FLOWERING SWEET-PEA CULTURE IN GREENHOUSES

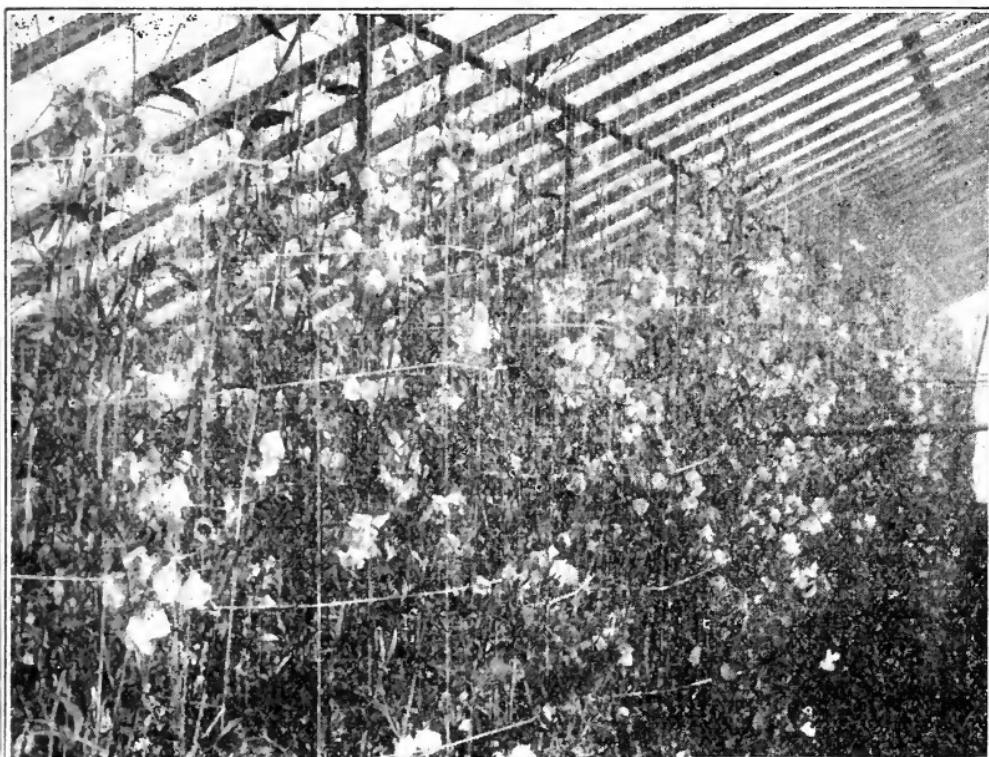
Soil Preparation

The ideal soil for the sweet-pea is sandy loam or black prairie soil such as that found around Chicago. Red shell soil is very excellent if taken about six inches of the surface; and very coarse gravelly soil, if well fertilized, will also grow very good sweet-peas. Soil taken from swampy places, provided it is not heavy clay, but only black sediment, is very good if not used the same year. Such soil should, in the fall, be spread out about sixteen inches thick on high ground. Left there over winter, the rain and frost will wash out any alkali which the soil may contain; white clover seed scattered over this is also very beneficial. In about six months, or say in June, compost may be made of this soil by using one part of short manure to three parts of soil. Use some air-slacked lime and coarse bone. Every florist should

also have a concrete reservoir, say about 20x50 feet and 3 feet deep. This may be constructed very cheaply, especially where gravel and sand are plentiful. All stable manure, if stored in this reservoir, kept moderately damp and stirred occasionally, makes the ideal manure. Such a reservoir if about four feet higher than the greenhouse, may be piped so that the manure-water, when properly diluted, may be used for the sweet-peas.

Greenhouse Construction

For December and January cutting only large houses should be used so that the sun can penetrate every corner. The sides of the houses should be at least eight feet high and made of glass at least three feet from the ground. In such houses it is possible to get satisfactory crops only during these two cloudy months. If you have not an up-to-date greenhouse, the sweet-peas should be sown later, say in October, after the fall crop has been harvested, like chrysanthemums, etc. Sweet-peas sown late this way will not bloom before February, at which time there is sufficient sunshine for a good flowering crop. All that is needed is eight feet of head room.



ZVOLANEK'S WINTER-FLOWERING SWEET PEAS, AS GROWN 1914, IN
MR. H. WEHRMAN'S GREENHOUSES, MAYWOOD, ILL.
Never in Chicago's history have Better Sweet Peas been shown.

Preparation of Beds

Solid beds of one and a half to two feet of good soil are the best. If the present soil is of the right kind, enrich it well with the prepared short manure, mixing it down to the base so that no big lumps are left either in the manure or in the soil. If the quality of the soil is not suitable, compost soil such as that mentioned should be put in place of it. Of course all this will be expensive, but in a few days it will be repaid by a good picking of flowers. After the soil is well prepared in the beds, it should be well tramped down, and if too dry, watered down evenly to the base, leaving it for several days until the soil is just in proper condition to work.

Germinating the Sweet-Pea Seed

Some years the seeds germinate more or less poorly, most of the seed-men claiming that certain varieties are hard-shelled, causing the seeds to take a longer time to come up. Judging from my own experiments, I find no difference in the varieties, all depending upon the temperature at the time when the seed ripened. We have each year many

hundreds of single sweet-pea plants growing, either crosses or plants especially selected for further testing or propagating. Such plants are labelled, and the seed is all hand-picked; the plants being gone over about three times before all the seed is picked, ten or fifteen days elapsing between each picking. Occasionally each picking has been sown at the same time, but in separate rows, side by side. Such experiments have been made for a number of years, and I find that sometimes the last picking has germinated more quickly than the first or the second, or *vice versa*. I have come to the conclusion that all seed which ripened in the hottest period became hard-shelled, and if sown would lay in the ground for several months before germinating. To prevent slow germination, soak the seed you intend to sow in water for about fifteen hours just before sowing. This will cause the seed to soften and swell so that when sown they will germinate quickly. Those seed which still remain hard should be filed. The best method is to use a very fine flat file, taking one seed in each hand and striking it once or twice over the file just enough to cut the hard skin. The seeds treated in this way should be dropped back into the water, and within another fifteen hours they will be soft, swollen up and ready to sow. One person can prepare a very large number of seeds in this way in a very short time.

Sowing the Sweet-Pea Seed

When the beds have been well prepared as described above, press the soil down as firmly as possible, and rake everything off very smooth. Then make rows at least five feet apart and drop the seed about three inches apart in the row, not more than one and a half inches deep. Be sure before sowing the seed that the soil is in just the right working condition. Never sow seed in soil which is too wet and sticky; rather wait a few days until all is right. Moreover, never sow white sweet-pea seed in dry soil which has to be watered before the seed is up. Any seed of this variety, if sown in dry soil and watered very soon after being sown, will seldom germinate. After all the seed is in, rake the surface of the bed very fine for about one inch deep. This will make a very fine pulverized soil mulch on the top, which dries off soon, thus preventing the lower moisture from escaping, besides keeping the entire lower soil very cool, which is very needful to sweet-peas when starting. If these directions are carried out, no watering will be necessary for ten days at least; or at any rate as long as all the seed is not up, or so long as you can find moisture about four inches below the surface. Sometimes I have let three weeks elapse before watering the

beds. This method encourages the seed to sink their roots deep in the soil, hunting for the moisture. Such sweet-peas, with deep roots, can withstand the hottest days without damping off, as is so often the case when the moisture is kept only on the surface. If it becomes necessary to water, you should water well down to the base, but not very often, keeping the surface rather dry and well worked. After sowing, the temperature should be kept as low as possible; and if the seed is sown in August, when the weather is extremely warm, the glass should be whitewashed slightly as long as the hot weather continues. Spraying the plants and glass from the inside between eleven a. m. and four p. m. also helps to keep down the extreme heat. After the sweet peas are up the plants may be sprayed several times each day during such hot spells.

Insects

Like almost all other plants, there are insects destructive to sweet-peas. The worst enemy of the sweet-pea is the Green Aphis, or so-called "green louse." This insect usually comes when the young plants are just breaking through the soil; so you should keep a continual watch on the plants as soon as they begin to grow. If you see only one or



ZVOLANEK'S WINTER-FLOWERING ORCHID SWEET PEA EXHIBIT AT THE NATIONAL FLOWER SHOW,
NEW YORK, APRIL 10, 1913.

Awarded: American Sweet Pea Society, Gold Medal; Society of American Florists, Silver Medal; Horticultural Society of New York, Silver Medal.

two in the whole greenhouse, do no wait until there are more, because if you do, within a few days every plant will be covered and very soon stunted if not entirely destroyed. The best remedy for the green louse is to spray with nicotine, or to fumigate with nicotine paper (*Aphis Punk*). Fumigating should be done only during cool nights when the temperature in the greenhouse is not over 66 degrees Fahrenheit, as the plants are very easily burned if fumigated in a higher temperature. About four to six sticks of fumigating paper may be used to one greenhouse 20x100 without injury. If the temperature, even at night, is over 66 degrees Fahrenheit, the plants in the house should be sprayed with a very fine sprayer. Automatic air pressure sprayers are very reasonable and a great deal of work can be done with one in a very short time. Nicotine is usually about 30 per cent strong. Only one part nicotine should be used to five hundred parts of water. The spraying should be continued until not a single louse is alive. During the late fall or winter, after the cooler weather has begun, fumigate once every week, even though there are no insects.

Mildew is sometimes very destructive to the plants, and is caused by a sudden change in the temperature. To prevent this, avoid opening the ventilator too much at once, especially after watering. As soon as the

first mildew is noticed, cut all the flowers and dust the plants either with Hammond Grape Dust, which is one of the best and cheapest preparations, or with the finest pulverized sulphur, adding to it some air-slacked lime. After about two days, syringe this off and repeat if necessary. When applying this be very careful not to blow any on the heating pipes, as the sulphur fumes very quickly on hot pipes, not only discoloring the flowers and buds, but if too strong, damaging the foliage.

The red spider is also sometimes very troublesome, especially in early fall or late spring. A good spraying with cool water when first noticed will eradicate this pest.

Temperature and Ventilation

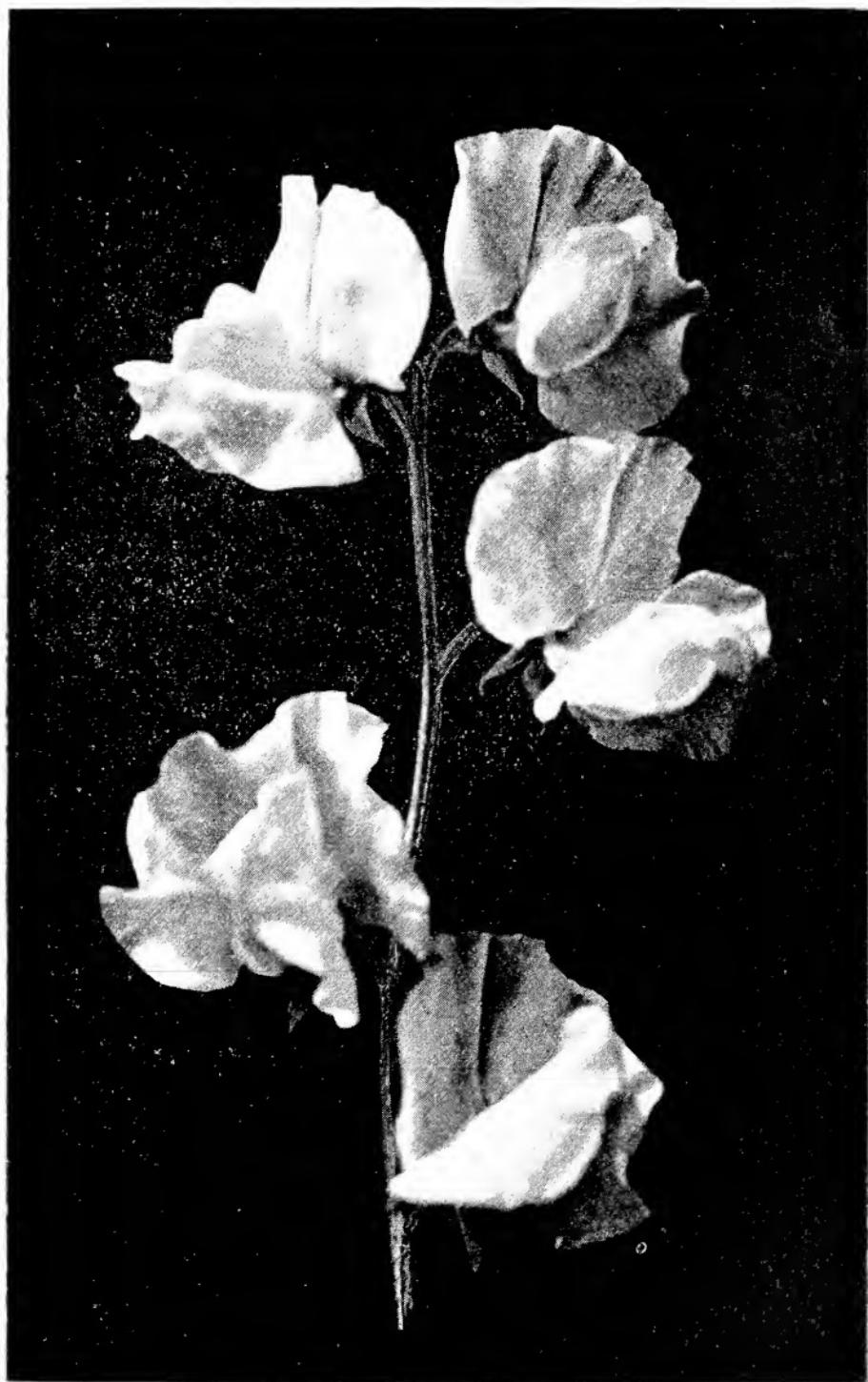
After the seed have been sown, keep the greenhouse as cool as possible, admitting air day and night as long as the weather will permit, and there is no danger of frost. The cooler it is when the plants are started, the stronger and healthier they become. It is necessary late in the fall to start firing, so that the steam and hot water may be turned in the heating pipes. Keep the temperature from 40 to 44 degrees Fahrenheit at night never any higher, for if it is kept too high

the young plants will begin to bloom too soon, and before the roots have had a good start. Such plants, forced in this way, usually produce very small flowers with short stems and of no commercial value. The Winter Sweet-Pea, if sown in August or later, when well grown should be at least thirty inches high before showing the buds. The higher they are in that stage the better the results. I would rather see sweet-pea plants four feet high, showing the first buds, as at two feet. Sometimes during especially warm and bright falls the plants show the tendency to bud very early. In this case I recommend picking all the buds as soon as they appear. This will give the plants better root-growth for the later crop. After the plants are two and one-half to four feet high, they will all bud. This is the time to raise the temperature, increasing it every night by one or two degrees. If the temperature averaged 44 degrees, make it 45 degrees the next day, and so on until 52 is reached. This is the highest temperature for the older winter grandiflora at night. When in bloom, 60 degrees during cloudy days, and 68 during bright days is best. All the new Winter Orchid-flowering Sweet-Peas, in the first stage, need the same treatment as that just prescribed above for the winter flowering sweet-pea; i. e., 40 to 45 degrees at night, and 55 to 65 during the day-time, according to the weather, if bright or

cloudy. But after these are in bud and flower, raise the temperature to 55 degrees Fahrenheit at night and 60 to 65 for cloudy days and 70 to 72 during bright sunny days. This higher temperature is necessary for the new strain, as the flowers are twice as large and the number of flowers to the stem twice as many; and the additional warmth prevents the falling off of the buds and causes the flowers to have brighter colors.

The Falling Off of Buds

Very often we hear of plants losing all their buds; and I have answered many hundred letters every year in inquiries made concerning the cause of this. To prevent this, keep an even temperature, especially during the night. If, during a frosty night, the temperature is 55 degrees Fahrenheit in the greenhouse, at seven o'clock in the morning the glass will be heavily frosted. As soon as the sun comes out the ice inside will begin to melt, causing a heavy dampness in the greenhouse. Many growers usually shut off the heating pipe as soon as the temperature begins to rise, but this should not be done, as the dampness thus kept in the greenhouse causes the buds to fall off. What should be done is to let the heat on for a while, but open



WINTER-FLOWERING ORCHID SWEET PEA, "MRS. A. A. SKACH."

the ventilator slightly so that the dampness may escape. As soon as the thermometer begins to rise one or two degrees, open the ventilator more and more, so that the highest temperature of 70 to 72 degrees may not be reached before eleven a. m. This should also be done gradually during the afternoon. From about two to three p. m. begin gradually to reduce the temperature by lowering the ventilator, never leaving it open until the temperature is entirely down to 55, but letting the ventilator go down by degrees.

If it becomes necessary to water, select only very bright days when you are sure that the ventilator may be kept open for several hours at a time. If, after watering, there is any sudden change in the weather, start the fires at once and leave the ventilators open as long as possible. Always keep dry air in as much as possible. During unusually warm and rainy weather, such as there has been around Chicago this year, falling off of the buds cannot be entirely prevented. However, particular growers can pick very good flowers even at such times. For example: I sent some seed to two growers in the Chicago section who are practically neighbors, and they received the seed the same day. Both planted it the same day. Early in January one began to ship the finest flowers ever seen in Chicago, while the other could not pick any until February.

Supports for the Vines

After the plants have reached the height of about six inches, they should be given something to climb on. The best method and the cheapest, is to run one wire on the bottom and one from eight to ten feet above each row, connecting these two wires with strings as is done in the case of smilax. Strings should also be run lengthwise of the row, about every ten inches, as the plants advance in growth. At the same time it is well, occasionally, to help the vines to climb on the strings. The upper wire must be one of the strongest, for when the sweet-peas are in full bloom they are usually ten feet high, and one row of one hundred feet will weigh a ton. If, at any time, the wire should break, all the flowers would become bruised, crooked and of very little value. In order to divide the weight, wooden or iron supports should be placed by the upper wire every eight feet.

Picking and Shipping the Flowers

The flowers should be picked during the afternoon, as at that time the flowers are in



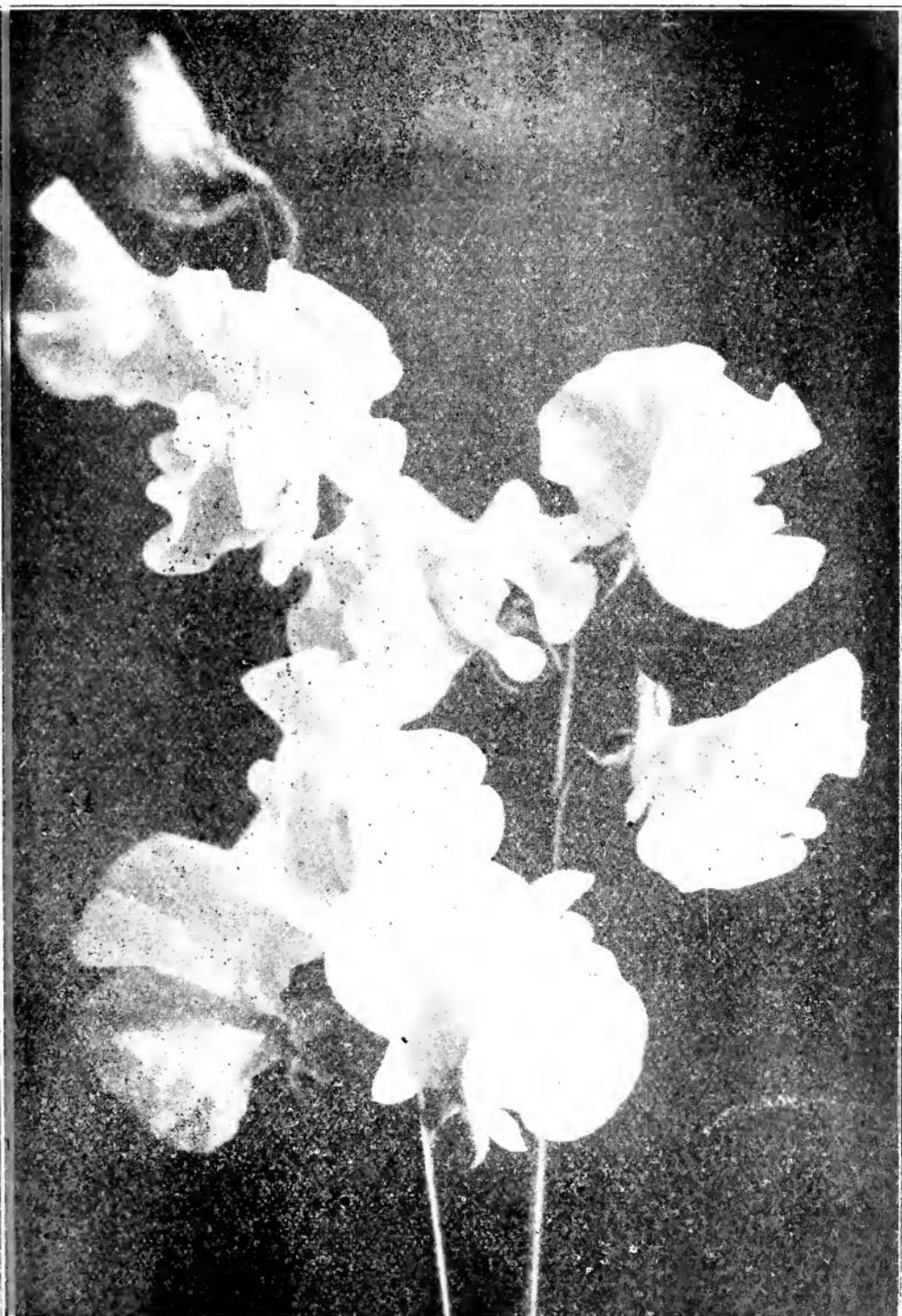
WINTER-FLOWERING ORCHID SWEET PEA, "MRS JOHN M. BARKER."

full bloom. Where many thousands of flowers are picked daily, the most experienced hand should go over the row first, picking only the best, with three, four and more flowers, with the longest stems, bunching it at once, ten selected flowers to a bunch. The second hand may go immediately after, picking the second grade, putting twenty-five sprays to a bunch; and finally the third hand should pick all the short and crooked flowers. If the flowers are to be sent a long distance to be sold the next day, pick all those flowers having three or more blooms and one or more buds. Remember that these flowers which you pick today will be distributed among the flower-buying public in twenty-four to thirty-six hours afterwards, and all must look fresh if you want good returns for them. As soon as a certain number have been picked, place them in water so that they are sure not to be wilted. About 6x6 flower-pots are ideal for the sweet-pea. Deep vases or large pails should never be used, for the blossoms may become wet, and in this way lose their fragrance. After the flowers have been in water for about three hours, they are ready to be shipped. Each bunch should be wrapped separately in fine wax, or tissue paper, then packed in boxes 8x30. Pack each wrapped bunch in the box, moderately firmly, with the flowers to the ends and the stems in the middle. During extremely cool weather the

boxes should be well lined with cotton sheeting, to prevent freezing. Between the stems use dampened paper or soft moss. Flowers picked in this way can be shipped a thousand miles without losing either fragrance or color. If the flowers are to be shipped the next morning, they should be packed the evening before, and kept in a room where the thermometer registers about 50 or 55 degrees Fahrenheit. They should never be left in water over night, or kept in a cool room, as this will cause them to lose both color and fragrance.

When to Sow the Sweet-Pea

To obtain a good crop of flowers for the Christmas trade, seed should be sown anywhere north of Washington, D. C., between the tenth and twentieth of August. It is very difficult to prescribe just the right time, for if the weather should be exceptionally warm and bright in the fall when the seed are sown, the main crop will be ready early in November when the price of sweet-peas is very cheap. On the other hand, if the weather is cool and cloudy in the fall when the seed are sown, the flowers will probably be too late for the Christmas trade. It is much better to have the crop in January, for during



WINTER-FLOWERING SWEET PEA, "WHITE ORCHID." (Blackseeded.)

that month and the following, the prices are usually just as high as during the Christmas week. Flowers should never be forced, for then the entire crop is apt to be lost. If the seed have been sown after the 25th of August, in any place north of Washington, D. C., fine flowers will be produced just after New Years, when they are most needed.

What to Grow with Sweet-Pea Crop

One of the most successful things to grow after the sweet-peas are over, is the tomato. If you have small and moderately warm greenhouses, or propagating beds, sow the tomato seed in November and then transplant in small pots and keep repotting until the plants are in pots five or six inches. When the sweet-peas (we may say after Easter) are becoming short-stemmed, take them out and put the tomatoes (which should be in bloom) in their place. Plant them about 16x20, train to single stem, and you should have good returns in June and July, having the space ready for sweet-peas again in August.

Violets are also very successfully grown in rotation with sweet-peas. These should be planted the last day of September. The beds should be five to six feet wide, with a

space twelve inches on the north side for one row of sweet-peas, and all the rest planted with violets. Both of these flowers may be planted at the same time, as the violets need a very low temperature—not much over 40 degrees Fahrenheit. The sweet-peas will grow very slowly at first, probably not being over three feet in height by the last of February. By this time the violets will have almost finished blooming, and anyway will be very cheap. Now is the time to raise the temperature to suit the sweet-peas, and in a short time you will have a splendid crop of sweet-peas lasting on until late spring.

Chrysanthemums may also be grown with sweet-peas. If you have a house with such early varieties as "Golden Glow" and "Pacific," these will probably all have been cut by October 20th. If sweet-pea seed are sown in four-inch pots September 10th, they will be fine plants by the time the chrysanthemums are over. The soil should be prepared and the sweet-peas planted at once, so that they will begin to bloom by the latter part of January. Other things may be grown between the sweet-pea rows, such as all kinds of bulbs, and flats with small ferns.

Fertilizers for Forcing

After the sweet-peas have been in bloom for some time, and have begun to shorten

in stem, they should be fertilized. The best thing is liquid cow or sheep manure, or pulverized manure. Nitrate of Soda should never be used, for it will do more harm than good. Another thing never to be used is Hydrocyanic Gas, for, although this destroys all insects, at the same time it destroys all the buds then in formation, so that there will be no flowers for many months to come.

Varieties to be Grown in Greenhouses

There are a great many varieties of the winter-flowering type of sweet-pea, and all of the old grandiflora are very well known. In place of the old type we now have the new *Winter Orchid-flowering*. Whoever has grown this kind will never return to the old grandiflora. The principal thing now is to select the best-selling colors. So far the bicolor has always sold best. Of this variety we now have the *Pink* and *White Orchid*, which has no equal for mid-winter flowering. In white there are the *White Orchid*, *Bridal Veil*, *Venus* and *Mrs. M. Spanolin*. In lavender the best are: *Lavender Orchid*, lavender pink; and *Lavender Nora*, which is a clear lavender and of the Winter Unwin type. It is of very good size, and averages as large as any of the Orchid-flowering type. In light pink we

have *Mrs. A. A. Skach*, *Mrs. J. Manda* and *Dolansky Orchid*. In dark rose there are the *Orchid Beauty* and *President Wilson*. These have no equal. The best in orange-pink is the *Orange Orchid*, but to this the *Orange Nora* and *Orange Bird* are close seconds. Both of these latter two are of the Winter Unwin type. These colors just mentioned are the best to grow in large quantities. There is very little demand for the dark blue, purple, red or variegated. In the dark blue, the new orchid-flowering *Mrs. M. Anderson* is the best, following the *Blue Jay* of the Winter Unwin. In red, the *Red Orchid* is the best. All light pink, dark rose and salmon pink varieties produce much brighter colors if made to bloom after the middle of January, when the weather is sunnier than in December.

Novelties in Sweet-Peas

When buying novelties, be very careful to spend large money for the seed, for you are apt to buy the same thing you have already purchased many years before. If you look over a long list of the names of the winter-flowering sweet-pea you will find at least a dozen varieties existing under different names. Some seedsmen become possessed with the

novelty fever, and if they can not get anything new, they simply give a new name to a variety existing. Then they advertise heavily. My best way to advertise is to send a sample of seed in which I have confidence, to my customers for a trial. Novelties are sometimes not well fixed, so it is best to be very careful of them, and use the older varieties for the most part.

PART II. OUTDOOR CULTURE

The outdoor culture of sweet-peas is very profitable provided a crop can be produced early enough. This may be done by starting the sweet-peas in pots in the greenhouses, or in cool frames in winter, planting these outside as soon as possible. Another plan to follow is to sow the seed in the field early in the fall. The fall sowing is usually best, for then the sweet-peas will bloom two or four weeks earlier than if sown in the spring.

The Selection and Preparation of the Open Field

The field to be selected is one where there is good, deep soil, where there is no danger of overflow, and where no water will stand. The field should be prepared at least a few weeks before the seed are sown, so that the soil may become firm and settled. Whether the seed are to be sown in the fall or the spring, the field should be prepared in the fall. If

the field is small, the trenches should be dug about twenty inches deep—the deeper the better—and about fifteen inches wide. Put the good top-soil on one side, the lower sub-soil on the other; then add about three to four inches of good manure in the trench, and cover it with the top-soil. This should then be covered with two or three inches more of manure, the rest filled up with the top-soil and all mixed thoroughly. The sub-soil spread between the rows. Make this all firm and smooth, and in a few weeks or so the soil will become well-settled and ready for the seed. If the field to be planted is large, a deep horse-plow may be used to make the trenches. The furrows should be plowed about four feet apart, and each one should be gone through about three or four times. The trench will then be 18 or 20 inches deep and wide enough. After all the trenches are plowed out, with the good top-soil on one side and the poor sub-soil on the other, put two layers of manure, ploughing each layer in with the top-soil. After the trenches are filled, take a common horse-cultivator and go through the trenches, mixing all well. Then spray the remaining poor sub-soil between the rows. The frost and rain will soon decompose this poor soil probably before the year is over.

The Proper Time in the Fall to Sow the Sweet-Pea Seed

Seed should be sown in the fall as late as possible, just before the ground is frozen solid, so that the seed may not grow above the ground, but produce only roots during the winter. If, in the part of the country you are in, the ground freezes the first of December, sow the seed about November 25th. During cool weather sweet-pea seed germinate very slowly, not coming above the ground inside of three weeks. Thus the freezing begins and the seeds lay dormant during the winter. Throughout the Eastern and Middle States north of Philadelphia, the best time to sow is during the last part of November; and a little earlier than this in the Northern States.

Method of Sowing

After the soil has been well prepared, sow the seed about two inches apart in the row. A good hand drill is the best thing to use, as the seed can be sown more easily by this than by hand. Seed should be sown much closer in the fall, as many seeds may become damaged during the winter. Both types,



ZVOLANEK'S WINTER-FLOWERING ORCHID SWEET PEAS, AS GROWN
BY MR. PARKER, NEAR BRISBANE, AUSTRALIA

summer and winter-flowering, are very well adapted for fall sowing. After the seed is in, take the plow and plow one ridge of each side of the row so that the seed may be covered six to eight inches with soil. This is done in order to give the right kind of drainage, and prevent the snow and rain-water from standing on the seed rows. Each ridge must now be gone over with a rake, or light harrow, and left until the heavy frost comes. After the ground is frozen solid, cover the ridges with straw, or any light litter. This is to prevent the soil from thawing and the plants from starting above the ground during any unusually warm winter weather. As soon as the heaviest freezes are past, remove the litter so that the soil may have a chance to dry out. When dry enough, which will probably be in about ten days, according to the weather, rake or harrow the ridges until the fields are very smooth, and the seed not any deeper than two inches, the depth they were planted in the fall. The roots of the seeds should now be six or ten inches deep in the ground, and the plants only about one inch out of the seed. Soon the plants will all be above the ground, but will grow very slowly during March. If a heavy frost comes during the first part of March, when all the sweet-pea plants are above ground, there is no cause for alarm, for the plants, grown in cool weather, will

easily resist heavy frosts, even when the temperature is 12 to 15 degrees Fahrenheit above zero, which is very seldom the case. After the warmer weather begins, the plants will begin to grow very rapidly. Now is the time to keep them well cultivated. Especially after each heavy rain the crust should be broken up, so that the soil is kept in a finely pulverized condition, at least as far down as two inches. This will hold the moisture in the ground. As soon as the plants are several inches high they should have supports placed for them to climb on. The cheapest method to follow is to place supports, 3x3 inches, 6 feet long, every 8 feet. Then run heavy wire on the top of these supports, one just on the ground, and connect these with any cheap twine, just as is done in the greenhouses. The only difference is that the supports need not be over six feet high, as the sweet-peas seldom grow more than five feet in height out of doors. With the warmer weather will come the Green Aphis, which, if not attended to at once, will soon damage or destroy the plants. The best remedy for outdoor plants is Nicotine. Nicotine at 40 per cent is usually recommended—one part to 600 parts of water. However, this solution is in every case too weak, and you will only be wasting time to use it. One part Nicotine to 300 parts water is much better. A solution even stronger than this may be used without

damage to the plants, as Nicotine evaporates much more quickly outdoors than in the greenhouses. The spraying should always be done with a fine nozzle and with plenty of force.

During dry spells, water well about once a week. The best way is to let the water run between the rows, then bank off a part and let it fill up two or three inches so that the soil may become well soaked down to the base. After irrigating in this manner, work the soil as soon as possible, and pulverize the surface again so that the soil may have no chance to crack.

Picking the Flowers Out of Doors

The flowers should be picked very closely, and when they are only half open and covered chiefly with buds. All the flowers should be picked very carefully, even those which are unsuitable to be sold, for outdoor sweet-peas begin to seed very quickly, and when once the seeds begin to swell the plants usually stop growing, the stems become short and very soon there are no blossoms.

Any winter sweet-pea, if sown in the fall out of doors, and treated as above directed, will usually begin to bloom the first part of May; while the late or summer-flowering va-

ieties will bloom the last of May or the early part of June, producing a fine flower and much better than if sown in the spring. Late flowering, or summer sweet-peas, if sown in the spring, should be sown before May 15th at the latest, for if sown later they will seldom bloom. Any winter-flowering variety may be sown at almost any time during the summer up until about July 15th. In the Middle states they usually begin to bloom in sixty or eighty days if sown between May 1st and July 15th. For a continuous crop through the summer, sow seed every two weeks.

PART III.

HISTORY OF THE SWEET-PEA

The sweet-pea was first discovered in 1695 by Patre Franciscus Cupani, of Italy. According to Professor Alvin C. Beal, Professor of Horticulture, Cornell University, Ithaca, N. Y., Cupani gave the seed the name of *Lathyrus distoplatyphyllos hirsutis molis, magno et peramoeo flore odoro*, and sent some to England and Holland. Professor Beal's *Sweet-Pea Studies*, volumes I, II and III, contain very instructive reading concerning the history of the sweet-pea from the time the sweet-pea was first discovered on the island of Sicily, over two hundred years ago, to the present day.

The first sweet-pea discovered was very small, its stem not being over six inches long, with only one or two flowers. The standard color was purple with blue wings. About sixty years later another kind of sweet-pea was discovered on the island of Ceylon, which had white flowers. These two varieties are probably the parents of the many hundred varieties of the present time. Until the year 1870, however, very few other kinds were originated.

The first sweet-peas of which I have any recollection were in the public school garden of my native town, Krucemburg, Bohemia. I attended this school between the years 1870 and 1876. The principal of the school was a great student of horticulture, and was noted far and wide as a collector of anything new or rare in the plant line. The sweet-pea at that time was very rare, but there were already at that time about ten or twelve distinct varieties in this garden, and all occupied a very prominent place.

This was where I learned to love this noble flower; and any spare time after school hours I used to go with my teacher to help him work among the flowers.

After leaving the public school in 1876, I became a florist in Vienna. Carrying some of the seed of each variety with me to my new place, I asked the manager of the greenhouse where I worked if there was any possibility of growing sweet-peas in the greenhouse during the winter. He agreed to try the plan with me. Part of the seeds we planted in pots and transplanted into the greenhouse in October; the rest were planted in cool frames. Notwithstanding the special care given them, the plants grew during the winter to be over thirty feet high, but not a single blossom appeared until late in April. The only ones with which we had any success were those planted in cool frames during

December. These blossomed sooner than those in the greenhouse, and as the flowers sold very well, the experiment was successful to a certain extent.

However, I was not yet satisfied. My idea was to get the flowers to bloom earlier. To accomplish this I realized that I must pollinate the sweet-pea with some other flower which bloomed early in winter; so I began to work along this plan.

After several years of experimenting, I found a common table pea, and a common vetch, which is largely grown for fodder purposes in Europe, among the sweet-pea rows, which had begun to bloom in winter. I at once began to pollinate these with the sweet-peas. These crosses were carefully labelled and kept separate from the other seed. After sowing this seed I noticed to my disappointment that these plants bloomed no earlier than any others. Several new colors and new hybrids were all I found. I selected the best seed to sow the next year. Sowing this seed the next year, I noticed that, notwithstanding the fact that only sweet-pea seed had been sown, there were several vetches among the plants of this second generation. This led me to the discovery that the sweet-pea may go back to the vetch after several generations. As the vetch hybrids were slightly different from the original vetch in color and foliage, I carefully

kept the seeds of each separate. First I sowed the vetch, but having only very few seeds, as most of them had been destroyed by a fire near by, I finally had only the sweet-pea hybrid seed left. This was in 1887, when I was preparing to come to the United States. In the fall of 1888 I came to this country, and a year afterwards was given charge of Mr. H. Bolte's greenhouses, Allentown, Pennsylvania. There I at once sowed the sweet-pea hybrids. Several weeks after sowing, many strange plants came up among the seedlings, entirely different in foliage and growth. This was a very exciting time for me. Soon I noticed that they had begun to form buds, and about sixty days after the seed were first sown, the first flower opened. The plants were only about 28 inches high, with one single branch. The flowers were very small, only one or two of brick red, purple and white with bluish-pink, on a stem. I kept each color separate, crossing them again with the best variety of sweet-pea existing at that time. It was in this year that Mr. Henry Eckford began his great work of improving the sweet-pea, and by the year 1889 there were thirty-five known varieties.

About the same year the D. M. Ferry Company introduced the famous "Blanche Ferry." This variety has put all other varieties in the shade. No wonder, for this

sweet-pea produces flowers with stems sixteen inches long, with three to four large flowers on each stem, at that time unknown.

I became very busy now crossing this new variety with my winter-flowering hybrids. In the second generation many different colors came. Three of the same shape as the "Blanche Ferry" were very much larger; one was pink and white, one pure white, and one blue. I selected the pink and white for propagating, and named it the "Winter Blanche Ferry." This variety began to reverse so badly to the old late flowering type, so I have not intended to introduce the same at all, but have given some seeds to many growers for test under glass. Recrossing the "Christmas Blanche Ferry" with the late flowering "Blanche Ferry," again I obtained the famous "Christmas Pink."

In 1893 Peter Henderson Company introduced the epoch-making white sweet-pea, "Emilie Henderson." This I re-crossed again with my "Christmas Pink," and the result was the pure white winter-flowering large hybrid which I later named the "Florence Denzer." This and the "Christmas Pink" were extensively grown for the New York stores from 1895 to 1898.

Having offers for my seed from many growers, many of whom offered me as much as \$150 a pound, I began to increase the seed as much as possible. I now began to adver-

tise, and in a few weeks, to my surprise, found I had sold all the seed. The orders had been scattered all over the world among the florists. About this same time one seed firm began to advertise the "Earliest of all Sweet-Peas," which, on close examination, I found to be nothing but my old "Christmas Blanche Ferry." As I have mentioned, this variety has the tendency to revert back to the late flowering, so that only about ten per cent has come into bloom during the winter. This seed has been offered very cheap, so that many florists have bought it, and planted it extensively in their greenhouses, but they are unable to cut any flowers until late in May; while those who have bought my "Christmas Pink" seed have picked flowers from Thanksgiving until late in the spring. This has probably been the best advertisement for my winter sweet-pea, and it has not cost me a cent. In many places the old "Christmas Blanche Ferry" and my "Christmas Pink" have been grown side by side, so that people have become convinced that Zvolanek's Winter Sweet-pea is the only one worth growing in greenhouses, regardless of the price. One Boston grower, who thought the price of \$10 a pound, which I charged for my sweet-pea seed at that time, exorbitant, bought the cheap kind, but he afterwards told me that he lost over \$5000, for he had no flowers all winter. Since then he has

ordered seed from me regardless of the price.

From that time I devoted my entire time to the sweet-pea seed, selecting only the best-selling varieties. About the year 1906 the sweet-pea fever began to exist among florists. One large greenhouse after another was built in nearly every section for sweet-peas alone. Sometimes whole glass ranches were constructed for them. The call for sweet-pea seed grew larger every year, the orders being doubled and tripled, until I began to think that the sweet-pea would soon be overdone. Instead of going down, however, the price of the flowers rose. This convinced me that people want this flower at any price.

In 1901 Mr. Silas Cole, an English gardener, had exhibited a new kind of sweet-pea which he called the "Countess Spencer," after his mistress. This new sweet-pea, when first exhibited, created quite an excitement among the English; and there was no wonder, for it was larger than any existing at that time, was of a beautifully wavy shape with, usually, four flowers on a long stem. The entire world learned of this new variety, and the name of Silas Cole has been written in golden letters in the history of the sweet-pea.

In the fall of 1902 an English friend, who had always admired my winter-flowering sweet-pea, sent me about seventy seeds of the new "Countess Spencer." Being well informed of its merit, I sowed it at once in the

greenhouse, and in early May the first flower opened. I was simply amazed at the magnificent flowers. As the seed had not been fixed, I obtained from these original seventy seeds nine different varieties, all of wonderfully wavy shape, colored blue, lavender, white, red, orange, yellow, rose and a few variegated. At once I began to hybridize each color on my best-selling winter sweet-pea, and within a week the whole greenhouse was full of nothing but tags, showing the records of the crosses. I must have made at least 5000 crosses during that first week. The seed of each cross I kept separate, and sowed the following fall. None of these crosses changed into the winter type, notwithstanding the fact that the Spencer pollen was used in the majority on the Christmas-flowering plants. Knowing from my former experiences that the best results are obtained in the second and third generation, I was quite delighted with my work, for I now had proof that the crosses had been successful. When these began to bloom, all being from the nine distinct colors, I could count nearly thirty, and most of these had changed the color of the winter varieties upon which they had been applied. The next year I sowed the seed again, and about 30 per cent came up as the common winter type; 10 per cent as the true winter Spencer; 20 per cent as the Winter Unwin, or improved grandiflora.

flora; and the rest remained the late flowering type. Now I had the three different types of sweet-pea—the "Winter-Flowering Spencer," the "Late-Flowering Spencer," and the "Improved Winter Grandi-flora." In all three types there has been a very wide range of colors. As the "Winter-Flowering Spencers" come into bloom I give all my attention to selecting each color, partly re-crossing it with the best "Late-Flowering Spencer," as this lot has contained the most beautiful colors and shapes. Sowing all three types again, there lay a surprise for me in the "Improved Winter Grandi-flora Hybrids." As I had not done any additional crossing on this type, all my attention being centered upon the winter Spencers, the "Improved Grandi-flora" changed about 30 per cent in the "Winter Spencer," and not one plant in one thousand reverted to the late-flowering type. They have remained the same to this day, only varying occasionally in the coloring. It was different with the "Winter Spencer," which came in the second year, and of which I had expected the most. Being sown with the rest, they revert nearly 50 per cent to the late-flowering type, and only in the fourth and fifth generation do they become the true winter bloomer, and then they still change color occasionally. The third lot of the late Spencer hybrids remained the late-flowering type in the third genera-

tion; only a few have since sprung into the winter type, but they have increased steadily in range of colors, so that by 1906 I counted sixty distinct colors. I have since done nothing with this lot, planting only a few every year to keep it alive.

After this I devoted my entire attention to selecting the best-selling colors of the winter-flowering Spencers. My places in Grand View and Bound Brook, New Jersey, were too small for so many varieties, so I sent all the seed to California, where the seed might be propagated very quietly. This was very necessary, as both my places are every year visited by many hundred florists, who are very anxious to obtain something new in the winter sweet-pea, and if they had seen the magnificent flowers there, they will do almost anything to obtain some of the seed.

My California place was just the ideal spot to work quietly, without being bothered by experts. In 1909 I planted over six acres for seeding purposes alone. In 1910 I planted these extensively in my Bound Brook greenhouses in New Jersey, and allowed the doors to be opened for inspection. Hundreds of florists came for thousands of miles around to see the flowers, and I shall never forget the expression on their faces when they saw these flowers first. In March, 1911, I exhibited some of the flowers at the second National Flower Show, in Boston,

and they were one of the chief attractions. One seedsman at once offered me \$100 for a single ounce of the seed; and one English florist offered a very high price, but I refused to sell any of the seed. Of course neither knew, but at that time I already had many acres in California planted in this same variety of sweet-pea.

For the 1911 crop I began to accept many orders from different places, for by the beginning of May of the same year, the fields in California promised a very large crop. Everything was in bloom when three very hot days came and burned all the flowers, so that when the time came for threshing out the seeds I obtained only about double the amount of seed I had planted. Because of these 3 hot days I had lost at least \$30,000. The year 1912 was very dry and the seed became very badly mixed, so that I could only sell a few of my special kind of seed in a mixture, just to let the florists become acquainted with the new variety.

In 1913, April 5 to 12, was held the International Flower Show in New York. The 10th of April was especially set aside for the sweet-pea exhibit. There was a large gathering of florists from various places, who came either to exhibit flowers or to see what was going on. In all there were 163 distinct varieties of sweet-peas exhibited in over a thousand vases. Of these 163 va-

rieties, I had originated 161 myself. Of course, there were about six varieties exhibited under different names. For instance: "Snow Bird" (Watching); "Winter Stella Morse" (Jack Hunter); "Flamingo" (Xmas Red); and several others which have simply been renamed by would-be originators.

The first twelve named winter orchid-flowering sweet-pea was introduced in 1913. As the seed crop was again very short—only about 20 per cent of the average yield, caused by the dry season—I was obliged to cut down every large order. By doing this I was able to send some of the seed to nearly 3000 florists.

We now have over eighty distinct varieties of the winter orchid-flowering sweet-pea. Of course no one will wish to have so many varieties at once, as twenty-five or thirty colors are all that a commercial grower can properly attend to.

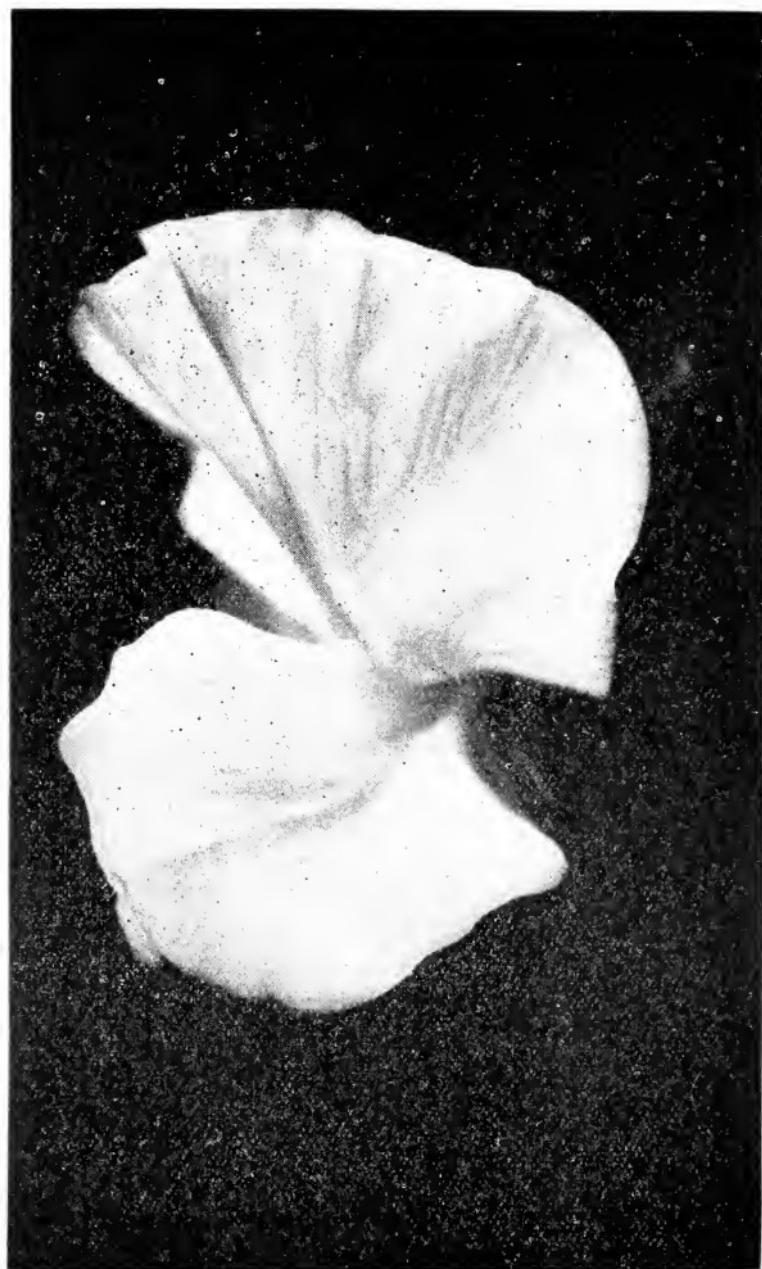
Just as in the past, many seedsmen simply renamed many of my original winter sweet-peas, there is now a tendency on the part of some to contend that they have themselves originated some of the winter-flowering type.

I have just been reading in one of our trade papers of one florist in England, the other in Australia, who have the same stock, but after examining the account closely, I find that both obtained the seed from me in

1911 or 1912. Neither one of them has anything new.

It is strange that, notwithstanding the fact that both foreign and American trade papers are well informed concerning this new orchid-flowering type, there is still one paper which tries to make their readers believe that there is better types of the winter-flowering orchid sweet-pea than mine. If this were true I would gladly extend my congratulations to my rival.

ANT. C. ZVOLANEK,
LOMPOC, CALIFORNIA.



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